Australian Government | acma

Australian Communications and Media Authority

Business operating procedure

Submission and processing of applications for space and space receive apparatus licences

AUGUST 2020

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Amendment history

Version	Date of effect	Comments
1.0	19 December 2017	Initial release.
1.1	26 July 2019	Updated to include Appendix E: Earth stations in motion (ESIM) communicating with space stations in the fixed-satellite service (both GSO and NGSO) in the frequency ranges 11.7–12.75 GHz (space-to-Earth) and 14–14.5 GHz (Earth-to-space). Refer IFC 6/2019 Earth stations in motion in Ku band.
2.0	December 2019	Draft for Industry consultation with proposed updates to include changes to licensing procedures, which were previously considered for the specific case of Ku band ESIM, for more general application. Refer IFC 38/2019 Review of space licensing procedures.
2.1	August 2020	Finalisation of IFC 38/2019 and updates to reflect outcome of IFC 40/2019 by extending Ku ESIM to 10.7 to 11.7 GHz, and include advice that the operation of earth station receivers is authorised on the no protection from interference caused by a point to point station in the frequency bands 10.7–11.7 GHz, 18.2–11.8 GHz and 19.3–19.7 GHz.

Contents

Contents (Continued)

Applicants or accredited persons must read the Disclaimer in conjunction with the procedures set out below.

1 Purpose

This business operating procedure (BOP) outlines the procedures to be followed when seeking the issue of *space* or *space receive* apparatus licences authorising operation of frequency ranges listed in the Radiocommunications (Communication with Space Object) Class Licence 2015.

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The procedures outlined in this BOP cover the assessment of the space-related[1] aspect of the licence application process only. The accredited person (AP) or applicant must provide the response from this process with the subsequent apparatus licence application. The ACMA will only issue an apparatus licence where the space-related assessment supports the application.

Note that this BOP does not cover the issuing of a *space* or *space receive* licence authorising the use of earth stations in motion (ESIM) communicating with space stations in the fixed satellite service in the bands 17.7–18.2 GHz, 18.8–19.3 GHz, 19.7–20.2 GHz, 28.5–29.1 GHz and 29.5–30 GHz. The relevant BOPs can be found in the procedures for space and space receive licensing section of the ACMA website.

Ku ESIM (10.7–12.75 GHz, 14–14.5 GHz)
Additional information on requirements for ESIM communicating with space stations in the fixed-satellite service (both geostationary orbit (GSO) and non-geostationary orbit (NGSO)) in the frequency ranges 10.7–12.75 GHz (space-to-Earth) and 14–14.5 GHz (Earth-to-space) is provided in Appendix E. That appendix should be read in conjunction with the requirements of this BOP.

Applications outside of current policy
In addition to the above exceptions, the procedures in this BOP are reflective of the status of satellite networks associated with typical licence applications and cover the majority of licensing scenarios only. Cases outside those outlined will be treated on a case-by-case basis.

2 Background

In considering whether to grant an application for a *space* or *space receive* apparatus licence, the ACMA is required to consider a range of matters. Depending on the application, the assessment process may require:

- consideration of consistency with current regulatory arrangements, including:
  - Australian space regulations related to *space* and *space receive* licences
  - the international (ITU) regulatory status of the subject satellite network
  - the international (ITU) registration details of the subject satellite network
- relevant government organisations to be consulted in relation to the application
- the licence type(s), necessary to authorise operation of the space station, to be determined

[1] The term *space-related* used here is intended to mean space-based network or space system, and not to mean *space* or *space receive* apparatus licence type.

> appropriate special condition(s) and/or advisory note(s) to be applied to the licence.

This BOP provides an overview of the processes associated with each of these steps.

Additional information on the arrangements for *space* and *space receive* licences can be found from the Apparatus licences area on the ACMA website.

3 Regulatory considerations

As with all radiocommunications services, frequency assigning and licensing needs to be consistent with current regulatory arrangements. At a high level, this means consistency with requirements as specified in the *Radiocommunications Act 1992*, the Australian Radiofrequency Spectrum Plan (the Spectrum Plan), frequency band plans (both legislative and administrative) and spectrum embargoes.

For the licensing of space-based communication systems (in this case, *space* and *space receive* apparatus licences), there is an additional requirement to check for consistency with Australian space regulations related to *space* and *space receive* licences, and the international (ITU) regulatory status and the international (ITU) registration details of the subject satellite network. This assessment is undertaken by the ACMA's satellite coordination area using information provided by the applicant or AP.

Further information on the assessment of the matters is below. This information should be checked before undertaking the procedures in other sections, as licences might be unable to be issued if these requirements are not met.

3.1 Australian space regulations

In order to issue a *space* or a *space receive* licence, the following requirements shall be met:

> the related space object (that is the space station) must be:
  > an Australian space object listed in the Radiocommunications (Australian Space Objects) Determination 2014
  > a space object that is owned, controlled or operated by a company/entity listed in the Radiocommunications (Foreign Space Objects) Determination 2014
> the frequency range of operation must be listed in the Radiocommunications (Communication with Space Object) Class Licence 2015 (Communication with Space Object Class Licence) which authorises the operation of the associated earth stations
> the service provided by the space station in the subject frequency range must be consistent with the Spectrum Plan.[2]

These requirements need be met before undertaking the other procedures that follow, otherwise licences are unlikely to be issued.

3.2 Determining the ITU regulatory status

It is necessary to ascertain the ITU regulatory status of the satellite network that the proposed space station is part of.

[2] Refer *Radiocommunications Act 1992*, section 104 Compliance with plans.

Information about the ITU regulatory status of a satellite network can be found by checking the ITU's Master International Frequency Register (MIFR). Knowledge of a network's progress with the ITU coordination process will be used to inform the ACMA's decision-making. The results of these checks are used in part to determine appropriate special condition(s) and/or advisory note(s) to be applied to the licence.

3.2.1 Recorded in the MIFR with favourable finding

If a satellite network is recorded in the ITU's MIFR with a favourable finding[3], then it is more likely that the risk of interference in Australia from the proposed service to existing licensed services is lower than for networks yet to be recorded in the ITU's MIFR. Special conditions and advisory notes that are specific to the situation must be applied to the apparatus licence (refer to Section 6).

3.2.2 Recorded in the MIFR and 11.41

If a satellite system is recorded under ITU RR No. **11.41** in the MIFR with an unfavourable finding against a licensed satellite network operating in Australia, the ACMA will require additional information that explains why the risk of interference should be considered low, as well as a letter of assurance (LOA).

In the case where an unfavourable finding is against an Australian-filed satellite that is not licensed in Australia, only a LOA is required.

3.2.3 Not recorded in the MIFR

In the case where a satellite network is not yet recorded in the MIFR but is progressing through the ITU coordination process, the ACMA may seek information using a LOA about its ITU coordination status from the satellite operator (via the applicant or AP) to ascertain whether or not the proposed satellite network is likely to be recorded in the MIFR.

The LOA is where the satellite operator advises the ACMA of any ITU published references, including coordination requests and/or notification notices, and particulars of any unresolved coordination issues. The LOA will also include a statement to the effect that measures will be taken to ensure that the operation of the satellite network in Australia will not cause interference to other satellite networks/systems operating in accordance with the ITU Radio Regulations. Details on the measures to be undertaken to not cause interference should be included in the LOA. The format of the LOA is at Appendix D.

Where the ACMA is assured of a likely successful outcome, the ACMA will progress the space station licence application. However, special conditions and advisory notes that are specific to the situation will be applied to the apparatus licence (refer to Section 6).

If information on a satellite system is yet to be published or processed by the ITU, the ACMA is unlikely to issue a licence, given the unknown scope of, or additional risk of interference.

[3] The term 'favourable finding' or 'unfavourable finding' refers to ITU BR assessment of the notification information with respect to No. 11.32 and 11.32A of the ITU Radio Regulations, resulting in the favourable or unfavourable finding.

3.3 Checking consistency with ITU registration details of the satellite network and proposed use

Upon determination of the ITU regulatory status of the satellite network, the ACMA needs to further check whether the ITU registration details of the satellite network are consistent with the characteristics of the proposed satellite-based radiocommunications service, as specified in the licence application, and that the service is consistent with the Spectrum Plan.

Checking consistency of ITU registration details with the proposed service and the Spectrum Plan may include (but is not limited to) the following factors:

- the frequency ranges:
  - the frequency ranges of the associated space station must be covered by the frequency ranges of the satellite network
- the class of station[4]:
  - the service purpose/function of the space station must be consistent with the station class(es) of the satellite network
- the service area:
  - the proposed geographic area covered by the associated space station must be within the service area of the satellite network
- the technical characteristics of the space station:
  - the technical characteristics of the space station must be within the envelope of the associated space station of the satellite network.

3.4 Information required for regulatory assessment

To assess the proposed satellite-based radiocommunications service against the above requirements for the ITU regulatory status and ITU registration details of the host satellite network, the licence applicant or AP may submit completed *space* and/or *space receive* licence application form(s) (depending on the type of licence being sought – see Section 5)[5], or alternatively, provide the information as listed at Appendix C in a summary table format to satellite.coordination@acma.gov.au.

Depending the specifics of certain licence applications, the ACMA may seek further information from the applicant or AP to assist with the assessment. For example, further information may include maximum equivalent isotropically radiated power (e.i.r.p.) or equivalent power flux-density (epfd) of the space station.

3.5 Interference management requirements

Information on how that applicant has assessed the risk and likelihood of interference to and from existing services licensed in Australia, both space-based and terrestrial, and what process the applicant will use to manage interference should it occur will be used to inform the ACMA's decision-making. The results of these checks are used in part to determine appropriate special condition(s) and/or advisory note(s) to be applied to the licence. Information required in this regard is outlined below.

See lists of space station class of station and earth station class of station in Preface to the BR IFIC (Space services).

[5] The application forms can be downloaded via this link.

3.5.1 Interference management and due diligence

The applicant is required to demonstrate their own due diligence and undertake an engineering assessment that considers the risk and likelihood of interference to and from existing services in Australia. A summary of how such an assessment has been made is to be provided to the ACMA as part of the licence application. An indicative list of information that could be provided is as follows:[6]

> a statement of various coordination agreements reached

> compliance with relevant FCC or ECC requirements

> engineering assessments undertaken.

3.5.2 Interference point of contact

The applicant is required to provide a point of contact that can assist in addressing any suspected cases of interference and cease transmission if directed by the ACMA. The details of the point of contact must be kept up to date.

3.5.3 Earth station interference management

The applicant is required to demonstrate that appropriate interference management measures are in place for all ubiquitous earth stations to be authorised (both fixed and mobile).

3.5.4 ITU requirements for NGSO/GSO/BSS

The applicant is required to demonstrate that ITU requirements for NGSO/GSO/BSS coordination have been (or are able to be) met as detailed in the table of frequency allocation footnotes as applicable to the frequency in the licence application.

3.5.5 Very large earth stations

For licensing applications for NGSO satellite networks, the applicant is required to demonstrate compatibility with very large earth stations notified under No. **9.7B** and No. **9.7A**[7]. ACMA would normally consult with the organisation that notified these earth stations as part of the assessment requirements.

3.5.6 Protection for the Mid-West Radio Quiet Zone

The Radiocommunications (Mid-West Radio Quiet Zone) Frequency Band Plan 2011 (band plan), which establishes a radio quiet zone (RQZ) in the Mid-West region of Western Australia, facilitates the development and use of new radioastronomy technologies at that site by maintaining its 'radio-quietness'. The band plan specifies the geographic zone affected.

The band permits use of the frequency range 70 MHz to 25.25 GHz in the RQZ for radioastronomy purposes. It also provides that additional services which operate in the inner zone of the RQZ are to be taken to be secondary services to radioastronomy services. Secondary services are required to not cause harmful interference to

[6] Note that this list of suggested information is provided for guidance. No only. The list is not exhaustive and no specific item (or combination of items) from this list is mandatory. The information provided by the applicant is expected to vary on a case-by-case basis.

[7] Note that in addition to the requirement to demonstrate compatibility with notified earth stations, there are GSO to GSO coordination requirements under No. **9.7** for the affected satellite networks associated with the very large earth stations. While these requirements should be considered (for example, as part of demonstrating that due diligence has been undertaken), they are considered separately to the requirement to demonstrate compatibility with notified earth stations.

radioastronomy services and cannot claim protection from harmful interference from radioastronomy services.

RALI MS32 *Coordination of apparatus licensed services within the Australian Radio Quiet Zone Western Australia* provides a framework for the interference protection of radioastronomy activities sited within 50 km of the centre of the RQZ. A potential frequency assignment falls within the scope of this RALI if the assignment is for an apparatus-licensed transmitter of a coordinated terrestrial service station or earth station, and its frequency and geographical location is within the RQZ.

While space and space receive licensees are not subject to RALI MS32, space and space receive licensees are subject to the requirements of the relevant band plan, and as such are responsible for ensuring that their end-user earth station terminals do not cause harmful interference to radioastronomy services in the RQZ. To increase the visibility of this obligation and make it explicit to licensees, Special Condition RQZ1 will be applied to space receive licences. Contact details for the entity responsible for operating the Murchison Radioastronomy Observatory are contained in RALI MS32.

3.5.7 Earth station receivers and 11/18 GHz point to point fixed link transmitters

Under the Communications with Space Objects Class Licence, the operation of earth station receivers is authorised on the basis of no protection is afforded from interference caused by a point to point station in the frequency bands 10.7-11.7 GHz, 18.2-18.8 GHz and 19.3-19.7 GHz.

Written confirmation from the applicant for space apparatus licences in those bands is required stating that they accept that operation of earth station receivers would be on the basis that no protection is afforded from interference — from either current or future fixed links, and that operation is not to constrain the future growth of fixed services in this band nor would they be considered in future replanning processes for fixed services.

4 Consultation with relevant government organisations

Due to possible security issues associated with foreign ownership of aspects of space communications, some applications may be subject to wider government consultation. In general, the ACMA will consult with relevant organisations in the following situations:

> new missions by existing ground stations that support (or suggest support) of foreign space systems, including the launch or early orbit phases

> new foreign-owned, or partly foreign-owned, earth stations and space support equipment[8]

> new Australian-owned earth stations that will provide support to foreign space systems, including launch or early orbit phases, except where the foreign space system is used solely for commercial communications (for example, television broadcasting).

[8] Space support equipment includes equipment that assists in the calibration of early orbit and on-orbit systems.

The applicants or AP should note that additional time may be required to process applications that are subject to wider government consultation.

5 Licensing arrangements for space stations

As for all other types of radiocommunications, a space-based radiocommunications system may not be operated in Australia without a licence. In general, there are two broad options for licensing of space systems in Australia.

The first option requires operators to obtain apparatus licences for each of their earth stations individually: an *earth licence* for the uplink and an *earth receive licence* for the downlink. Under this approach, a licence is not required for the space stations aboard a satellite.

The second option involves a combination of apparatus and class licences. In certain bands specified in the Communication with Space Object Class Licence, it requires operators to obtain a licence for the space stations aboard a satellite with a *space licence* for the downlink and a *space receive licence* for the uplink. Earth stations in the network are then automatically authorised collectively under the Communication with Space Object Class Licence. This approach is typically used for satellite systems with numerous or ubiquitous earth stations. It provides an efficient means of licensing a large number of earth stations, avoiding the need to obtain a licence for every earth station in a satellite system.

A key requirement irrespective of which approach to licensing is used is that the satellite system must normally be filed with the International Telecommunication Union (ITU) by the ACMA or equivalent national administration of an ITU member state.

If an operator wishes to licence a satellite system under the second option, the controlling business entity must first be included in either the Radiocommunications (Australian Space Objects) Determination 2014 (Australian Space Objects Determination) or the Radiocommunications (Foreign Space Objects) Determination 2014 (Foreign Space Objects Determination). In the context of space station operation, the *space* and *space receive* licence types may be used to authorise the transmission (downlink, that is, space-to-earth direction) and the reception (uplink, that is, earth-to-space direction) of space stations.

5.1 Space Objects Determinations

The Foreign Space Objects Determination and the Australian Space Objects Determination are legislative instruments made by the ACMA that extends application of the Radiocommunications Act to:

> In the case of the Foreign Space Objects Determination, space objects owned, controlled or operated by foreign business entities listed in the determination; and,

> In the case of the Australian Space Objects Determination, Australian space objects listed in the Determination. The ACMA considers Australian space objects to be those associated with satellite operators who have successfully applied to the ACMA seeking to achieve access to frequencies through the International Telecommunication Union (ITU) process

This has the effect of requiring radiocommunication between these space objects and earth stations inside Australia to be authorised by a licence issued by the ACMA.

A satellite operator must first be included in either Section 4 of the Australian Space Objects Determination or Schedule 1 of the Foreign Space Objects Determination before a satellite network can be licensed to operate in specific shared satellite radiofrequency bands listed in the Communications with Space Object Class Licence.

Inclusion of an entity in either the Australian Space Objects Determination or the Foreign Space Objects Determination does not confer a right on that entity to obtain a licence nor operate in frequency bands identified in the space object class licence. Rather, it is a necessary prerequisite that must be in place before a space or space receive apparatus licence can be issued.

Before varying either Determination, the ACMA must undertake consultation in accordance with the requirements of the *Legislation Act 2003*.

By being included in the Foreign Space Objects Determination, the relevant company is agreeing to be bound by Australian spectrum management regulations, however these generally only come into effect if a licence is issued.

The following information is required as part of any application for inclusion in the Foreign Space Objects Determination and the Australian Space Objects Determination as indicated below.

1) Timeframe information regarding deployment of the satellite and terrestrial components and timeframe for lodgement of licensing applications to the ACMA.
2) General information on the service to be delivered, potential customers, etc.
3) In the case of the Foreign Space Objects Determination, information explaining why inclusion of the relevant entity in the Determination is in the Australian interest.
4) The correct name of the company to be included in the Determination (in the same format as others listed in the Determinations)
5) Evidence that there is an authorisation/agreement/request from this company for to request the modification of the Determination or contractual agreement between both companies indicating that such request is necessary.
6) Information that demonstrates the proposed inclusion would meet the classifications in the determination. For example, in the case of the Foreign Space Objects Determination, information confirming eligibility to be listed in Schedule 1, being *owners, controllers or operators of foreign space objects operating in frequency range mentioned in class licence*. This could include a record of incorporation in the relevant foreign jurisdiction.
7) Evidence that the person making the request is authorised to do so.
8) In the case of the Foreign Space Objects Determination, information on the ITU satellite filing, which administration it was filed by, and evidence that company listed controls the company that has the filings and has the ability to cease providing transmissions to Australia if requested to by the ACMA.

The decision to update the Determination is a matter for the Authority of the ACMA. Accordingly, the information supplied needs to be of standard that would satisfy a legal due diligence check. The ACMA typically updates the Determinations approximately once per year, preferably combining a number of requests in a single update.

6 Special licence conditions and advisory notes

The Radiocommunications Licence Conditions (Apparatus Licence) Determination 2015 (LCD) specifies general conditions of operation that are common to most apparatus licence types. Additional conditions not in the LCD may be included on individual apparatus licences to address issues specific to an assigned service. These conditions are printed on the licence under the heading 'Special Conditions'.

In addition, ‘Advisory Notes’ may also be included on licences to inform licensees of matters relevant to a particular service. Unlike licence conditions, advisory notes do not impose a legal obligation on the licensee.

Appendixes A and B detail the special conditions and advisory notes that are to be included on *space* and *space receive* apparatus licences. Where a special condition or advisory note is not pre-defined, the ACMA will develop and include appropriate conditions or advisory notes on the licence.

For Ku ESIM refer to Appendix E for requirements in addition to those outlined in the main body and other appendices of this document.

7 Further information

Please contact the ACMA’s Customer Service Centre at info@acma.gov.au.

Appendix A: Recorded in the MIFR

Where the satellite network has been successfully coordinated and is recorded (notified) in the MIFR with favourable finding or is recorded under ITU RR No. 11.41 in the MIFR with an unfavourable finding against a licensed satellite network operating in Australia:

A.1 Special Conditions

Pre-defined (SB)

1. Operation of this space station and associated earth stations must be in accordance with frequency assignments recorded in the Master International Frequency Register (MIFR) of the International Telecommunication Union.

Pre-defined (EQ)

2. The licensee shall advise the ACMA of changes to the point of contact provided for the purpose of tracing any suspected cases of interference.

Pre-defined (RQZ1)

3. Earth station transmitters on land associated with this space station must not be operated within 70 kilometres distance from the Murchison Radioastronomy Observatory without the approval of the entity responsible for operating the Murchison Radioastronomy Observatory.

Pre-defined (EM) (in MIFR with 11.42)

4. Upon receipt of a report of harmful interference under International Telecommunication Union Radio Regulation No. **11.42** all necessary steps shall be taken to immediately eliminate the harmful interference or cease operation.

User-defined

5. This licence authorises communications with *[ITU satellite network name].*

A.2 Advisory Notes

Pre-defined (EI)

1. The Master International Frequency Register (MIFR) is maintained by the International Telecommunication Union (ITU) in accordance with the Radio Regulations.

Pre-defined (EN)

2. This licence does not authorise operation of earth stations outside of Australia.

Appendix B: Not recorded in the MIFR

Where the satellite network is still under coordination and has not as yet been recorded (notified) in the MIFR:

B.1 Special Conditions

Pre-defined (EH)

1. Transmissions must not occur in circumstances that result in harmful interference to stations outside of Australia where these stations are operating in accordance with the Radio Regulations of the International Telecommunication Union except where the transmissions are in accordance with any agreements reached as a result of an ITU international frequency coordination process.

Pre-defined (SA)

2. Prior to the frequency assignments being recorded in the Master International Frequency Register (MIFR) of the International Telecommunication Union (ITU), this space station and associated earth stations may operate in accordance with the operating parameters published by the ITU in Special Section*s* of International Frequency Information Circulars and in accordance with any agreements reached as a result of an ITU frequency coordination process.

Pre-defined (EQ)

3. The licensee shall advise the ACMA of changes to the point of contact provided for the purpose of tracing any suspected cases of interference.

Pre-defined (RQZ1)

4. Earth station transmitters on land associated with this space station must not be operated within 70 kilometres distance from the Murchison Radioastronomy Observatory without the approval of the entity responsible for operating the Murchison Radioastronomy Observatory.

User-defined

5. This space station and associated earth stations are authorised to communicate with the *[satellite network name]* satellite network as published by the International Telecommunication Union (ITU) in Special Section *[ITU reference – take the most recent document number]* of International Frequency Information Circular *[IFIC number]*.

Pre-defined (EM) (when not recorded in MIFR)

6. Upon receipt of a report of harmful interference under International Telecommunication Union Radio Regulation No. **11.42** all necessary steps shall be taken to immediately eliminate the harmful interference or cease operation.

B.2 Advisory Notes

Pre-defined (EI)

1. The Master International Frequency Register (MIFR) is maintained by the International Telecommunication Union (ITU) in accordance with the Radio Regulations.

Pre-defined (ED)

2. Coordination agreements reached as a result of an ITU international frequency coordination process are intended to minimise the potential for harmful interference to radiocommunications stations. A radiocommunications station operated prior to a frequency assignment being recorded in the MIFR cannot necessarily claim protection from harmful interference from radiocommunications stations of other countries.

Pre-defined (EN)

3. This licence does not authorise operation of earth stations outside of Australia.

Appendix C: Information required for regulatory assessment

Table 1: Information required for *space* and *space receive* licences

Category	Example 1	Example 2
Licence type	Space receive	Space
Licence renewability (ongoing/ non-ongoing) and licence period	Non-ongoing (6 months)	Ongoing (initial 1 year)
Direction	Uplink	Downlink
Frequency lower bound (MHz)	1611	11701
Frequency upper bound (MHz)	1612	12400
Service purpose (communications, TT&C, broadcasting reception)	Communications	Broadcasting reception
The related ITU satellite network name[9]	SAT-A	SAT-B
The orbital longitude of the satellite network	NGSO	140E
The service area where associated earth stations operate[10]	NSW	Australia-wide
The owner/controller/operator of the related satellite network	Organisation A	Organisation B

Note: depending on the specifics of certain licence applications, the ACMA may seek further information from the applicant or AP to assist with the assessment.

[9] Failure to provide accurate ITU satellite network information will delay the process. The ITU SNL database (Part B) is a useful tool for checking the accuracy of the satellite network name. See http://www.itu.int/net/ITU-R/space/snl/bsearchb/spublication.asp.

[10] A map illustration for the service area will be possibly needed.

Appendix D: Letter of assurance pro forma

This pro forma is to be used when a satellite filing has not been successfully recorded in the Master International Frequency Register (MIFR).

The application for a licence to communicate with [*satellite commercial name*] in the frequency bands [*insert frequency bands*] will use the [*ITU satellite filing name*] satellite filing, for which the International Telecommunication Union (ITU) has published 'special sections' such as [*CR/C xxx in IFIC XXXX (only include one—preferably the CR/C publication)*]. This filing has been made by the Administration of [c*ountry name*], and has orbital position/characteristics of [*XXX E/W* (GSO) or contains a constellation of *P* satellites in *Q* planes at *R* inclination and *S* altitude (NGSO)].

[*Satellite operator*] provides the following assurances[11] to the ACMA to support applications for licences within Australia:

1. Coordination with other administrations for the [*ITU satellite filing name*] satellite filing has begun, but has not yet resulted in a 'favourable finding' (Part II-s) notification published by the ITU in a fortnightly international frequency information circular (IFIC).
2. To the best of our knowledge, operation in accordance with the [*ITU satellite filing name*] satellite filing will not cause harmful interference to other satellite networks operating as per the ITU Radio Regulations.

In the event of any actual case of harmful interference (to other satellite networks operating as per the ITU Radio Regulations), all efforts will be made to immediately address and resolve such interference.

[11] If the above assurances do not cover all communications to/from the satellite, please indicate the limits of this assurance (for example, if it only applies to a particular frequency band or company).

Appendix E: Earth stations in motion communicating with space stations in the fixed-satellite service (both GSO and NGSO) in the frequency ranges 10.7–12.75 GHz (space-to-Earth) and 14-14.5 GHz (Earth-to-space)

This appendix outlines additional procedures to be applied when considering the issue of space or space receive licences authorising the use of ubiquitous earth stations in motion communicating with space stations in the fixed-satellite service (both GSO and NGSO) in the frequency ranges 10.7–12.75 GHz (space-to-Earth) and 14–14.5 GHz (Earth-to-space).

Modified treatment when checking consistency with ITU registration details of the satellite network and proposed use

When determining the ITU registration details of an FSS filing involving the operation of ESIM, the procedures of *Section 3.3 Checking consistency with ITU registration details of the satellite network and proposed use* should be followed, along with other considerations.

These other factors that are particularly relevant for ESIM operation when checking consistency of ITU registration details with the proposed service and the Spectrum Plan are the class of station and the service area of the filing, as detailed below:

> service purpose/function of the space station must be consistent with the class(es) of station[12] of the satellite network. In the ACMA's experience, ESIM do not always meet this requirement. There are currently no class of station codes specific to ESIM operation in Ku band. Further, an analysis of ITU satellite filings for networks currently known to be operating or planning to operate ESIM only include class of station code EC (Space station in the fixed-satellite service), but no codes indicating mobile operation.

> proposed geographic area of the licence must be included within the satellite network filing and that area must include Australia. This requirement is to ensure the operation within Australia has been considered in the ITU satellite coordination process and as a way of ensuring services to Australia are within the operating envelope of the network. This requirement is to be maintained for Ku band ESIM.

Downlink (space-to-Earth) 10.7–12.75 GHz:

Applicants should demonstrate that if the licence application was assessed assuming the use of traditional fixed Earth stations, the risk of interference would be low. Applicants must then demonstrate that use of receiving ESIM is within the operating envelope of the ITU registration details. Receiving ESIM will be supported provided the technical characteristics are within the envelope of the ITU registration details. In this case, receiving ESIM operation is supported under ITU RR No. **4.4**.

[12] See lists of space station class of station and earth station class of station in Preface to the BR IFIC (Space services).

Uplink (Earth-to-space) 14–14.5 GHz
ITU registration details should be checked to determine whether they include MSS, earth stations on board vessels or aircraft earth stations. If so, ESIM can be operated under existing ARSP allocation and footnotes.

Alternatively, applicants should demonstrate that if the licence application was assessed assuming the use of traditional fixed Earth stations, the risk of interference would be low. Applicants must then demonstrate that use of transmitting ESIM is within the operating envelope of the ITU registration details. Transmitting ESIM will be supported provided the technical characteristics are within the envelope of the ITU registration details. In this case, transmitting ESIM operation is supported under ITU RR No. **4.4**.

Interference management and due diligence
When demonstrating due diligence and evidence of an engineering assessment that considers the risk and likelihood of interference to and from existing services in Australia, the procedures of *Section 3.4.1 Interference management and due diligence* should be followed. This may include information regarding compliance with relevant FCC or ECC requirements including:

- equivalent isotropically radiated power limits for ESIM
- ESIM controlled by a network control facility
- power flux density restrictions
- ESIM that use closed-loop tracking of the satellite signal shall employ an algorithm that is resistant to capturing and tracking signals from nearby satellites; earth stations shall immediately cease transmissions when they detect that unintended satellite tracking has occurred or is imminent

Summary of additional special conditions and advisory notes applicable to Ku band ESIM

Space apparatus licence authorising ESIM in 10.7–12.75 GHz
The following additional special conditions and advisory notes are to be applied to space licences authorising the use of earth stations in motion communicating with GSO space stations or NGSO space systems in the fixed-satellite service in the frequency band 10.7–12.75 GHz, in line with the procedures outlined above.

Category	Type	Item	Text
Special condition	Pre-defined	ESIM8	Earth stations in motion may be operated in association with this licence provided that these earth stations would, if stationary, otherwise be in accordance with the operating parameters published by the ITU in Special Sections of International Frequency Information Circulars and in accordance with any agreements reached as a result of an ITU frequency coordination process.
Special condition	Pre-defined	ESIM5	Radiocommunications between space stations and earth stations in motion authorised under this licence shall not be used or relied upon for safety-of-life applications.

Space receive apparatus licence authorising ESIM in 14–14.5 GHz

The following additional special conditions and advisory notes are to be applied to space receive licences authorising the use of earth stations in motion communicating with GSO space stations or NGSO space stations in the fixed-satellite service in the frequency band 14–14.5 GHz, in line with the procedures outlined above.

Category	Type	Item	Text
Special condition	Pre-defined	ESIM8	Earth stations in motion may be operated provided that these earth stations would, if stationary, otherwise be in accordance with the operating parameters published by the ITU in Special Sections of International Frequency Information Circulars and in accordance with any agreements reached as a result of an ITU frequency coordination process.
Special condition	Pre-defined	ESIM4	Radiocommunications between space stations and earth stations in motion authorised under this licence shall be subject to permanent monitoring and control by a Network Control and Monitoring Centre (NCMC) or equivalent facility and be capable of receiving and acting upon at least 'enable transmission' and 'disable transmission' commands from the NCMC.
Special condition	Pre-defined	ESIM5	Radiocommunications between space stations and earth stations in motion authorised under this licence shall not be used or relied upon for safety-of-life applications.